THE ROCKS KNOWN AS MEXICAN ONYX.

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I have the honor to present before this Academy a report upon the calcareous rocks of Mexico, which so deservingly are occupying the attention of the public in the present International Exhibition.

These rocks are known in Mexico by the names of "Tecalli," "Mexican Onyx," and "Mexican Marble." The first of these names refers to the place where they are found, as the principal beds are located in the neighborhood of the town of Tecalli, in the State of Puebla. The word Tecalli is a compound one, and, in my judgment, is derived from two Aztec words: *Tetl* (mountain) and *Calli* (house), the meaning in this case being "House of the Mountain." The origin of the word might be supposed as well to be *Teocalli* (God's Mansion), name given by the Indians to their temples.

The names Onyx and Mexican Marble are due: the first, to the fact that, like the true onyx, the Mexican rock shows stains and parallel stripes; and the second, to their chemical composition, which, in point of fact, is the same as that of the common marble.

I have read in some of the latest European journals that Mr. D'Amour informed the Academy of Sciences of Paris, that the Mexican onyx was nothing but a *calcareous alabaster*. This same opinion was expressed by myself, more than two years ago, in the "Mexican Society of Natural History." It was published in the first number of the third volume of "La Naturaleza," and I have been most happy to learn that the classification of that celebrated chemist agrees with mine.

The rocks of Tecalli offer a great many varieties in their different grades of transparency, in the diversity of their colors, and in their physical properties. In order to make a close examination of these rocks, I selected a white specimen, as I considered this to be the purer variety. The characteristics were as follows:—

Irregular form. H = 4.90 (Breithaupt's scale), G = 2.90. Lustre vitreous—resinous. Color white, slightly tinged with green. Transparent in thin slices, and translucent in pieces of some thickness. Fracture splitting in the oblique section and fibrous, with a somewhat silky appearance in the vertical section. Streak white.

B. B. infusible, becoming opaque and with a light reddish color. In two analyses made I found the following composition:—

Lime	55.00
Magnesia	1.25
Water and oxide of iron and manganese	0.10
Carbonic acid	42.40
Sulphuric acid	1.25
	100.00

This composition shows that the rocks are essentially formed by carbonate of lime, and that the other substances may be considered as accidentally mixed, because of their existing in different proportions in the red, green, and yellow colors, as observed in the block.

The small proportion of sulphuric acid discovered was probably in combination with the lime, as the quantity of this base exceeded that which is required for combination with 42.40 of carbonic acid; for this proportion of the acid are required 93.96 of lime. The excess of this base is 1.04, which would take 1.48 of sulphuric acid to form the hydrous sulphate (Anhydrite), being this amount of acid very similar to that found in the analysis.

The oxides of iron and manganese, as well as the selenite, were mixed only with the carbonate of lime, which alone formed the bulk of the analyzed specimen.

Prof. W. J. Ward lately presented to the Royal School of Mines in London a qualitative analysis of the same rock, having found exactly the same substances that I did myself on my examinations; but, I understand he selected one of the most colored varieties, as he found the iron in large proportions, and partly combined with the carbonic acid. He found the sulphuric acid, and also the oxides of iron and manganese, which latter he considers to be the only coloring matters.

The capricious variegation of colors produced by those oxides, as well as the different grades of transparency and opacity in the polished slabs, give them that magnificent aspect which constitutes their indescribable beauty. When the blocks are cut in the direction of their planes of stratification, the shades appear in the form of clouds, flames, and stains of all dimensions. The clouds at times appear simulating somewhat the form of *cumuli*, or that of *cirrus*. The combination of those extreme grades, and

of other intermediaries, added to the difference of opacity in some portions of the same slab, produce the most beautiful and inimitable effects. In some we find the figures of mountains, ruins, and several other objects which look very much like landscape sketches. The colors vary from the dark-green to the apple-green, and from the intense red to the lightest rose tint. There are also varieties of yellow and blue which intermingle with the former. The metallic oxides which produce this coloration are found in greater proportions towards the borders of the veins of some of the rocks, and through which was effected the infiltration of the waters which contained the coloring materials.

The rocks of Tecalli admit of a higher polish than the common marble. This can be seen in the many specimens now on exhibition in the Mexican Department of the Main Building, and which, by their brilliant surfaces, colors, and transparency, admirably imitate the agates and the true onyx.

By the foregoing peculiarities we find that the Mexican marble belongs to the group of the *calcite*, and from its physical properties to the variety designated as *Travertine*, under which head is classified the *calcareous alabaster* or *onyxite*.

The good reception of these rocks in the markets, the extent of their deposit, unequalled perhaps in this respect, give them sufficient interest to deserve the names of *Onyx* and *Mexican Marble*, a name which probably will be always adopted in commercial language. The beds of the rock are situated in the neighborhood of the town of Tecalli in the State of Puebla.

In a report which the Mexican Engineer, Mr. Patricio Murphy, made two years ago, he mentioned three principal deposits which bear the names of "La Pedrera," "Tlahualco," and "Aratleta." The most important of these is the first named, located at twenty miles from the city of Puebla. According to Mr. Murphy, the mountain where the Mexican marble is found is alternately formed of beds of this rock, argilleous calcareous rocks, and marls and sands. The quantity in which those rocks are found is very extensive, and warrants the expectation of an almost unlimited supply. It is to be hoped that the use of these rocks will be soon extended, because, as they are far more beautiful than marble, and resemble so much the true onyx and agate, they are appropriate for the richest and most splendid decorations.